

ABSTRACT

In the oil and gas industry, the temperature of produced waste water is regulated in PERMENLH No.19 of 2010. The temperature permitted before the produced waste water is discharged into the forest is 45 ° C. The cooling process of produced waste water is carried out by using an aerator installed inside the cooling pond. The addition of production wells will increase the amount of waste produced. The asset team's effort in maintaining production by carrying out the size up of 26 production wells resulted additional 45,000 BWPD of waste water entering the cooling pond. This will cause the temperature of produced waste water to be disposed of into the forest to increase and not meet the temperature limits set by the government.

In this study a simulation was conducted to determine the optimum number of aerators, so that the cooling process of cooling ponds by aerators could meet the temperature limits set by the government. Cooling is done using the spray cooling method. In addition, this study also conducted a simulation to find out the optimum pattern of aerator placement to get the greatest temperature reduction.

From the simulation, it was found that 8 units of aerator were enough to cool the fluid inside the cooling pond according to the temperature threshold set by the government. For the aerator placement pattern, the type C placement pattern wherein the entire aerator is arranged in a row at the center of the cooling pond, is the best placement pattern, because with this placement pattern the largest fluid temperature reduction is obtained.

Keywords: aerator, spray cooling, temperature, placement pattern, and simulation